Soda Springs P4 Plant - CERCLA Update

February 11, 2019

CERCLA Response Teams

- IDEQ: Stan Christensen, Bill Lawrence, Doug Tanner
- EPA: Kathryn Cerise
  - Jacobs (CH2)
- Bayer: Jason Maughan, Brad Dykstra, Roger Gibson, Trent Clark, Ryan Yamauchi, & (Engineering Support Staff)
  - Golder Associates

Information Request from City: 2018 Year in Review

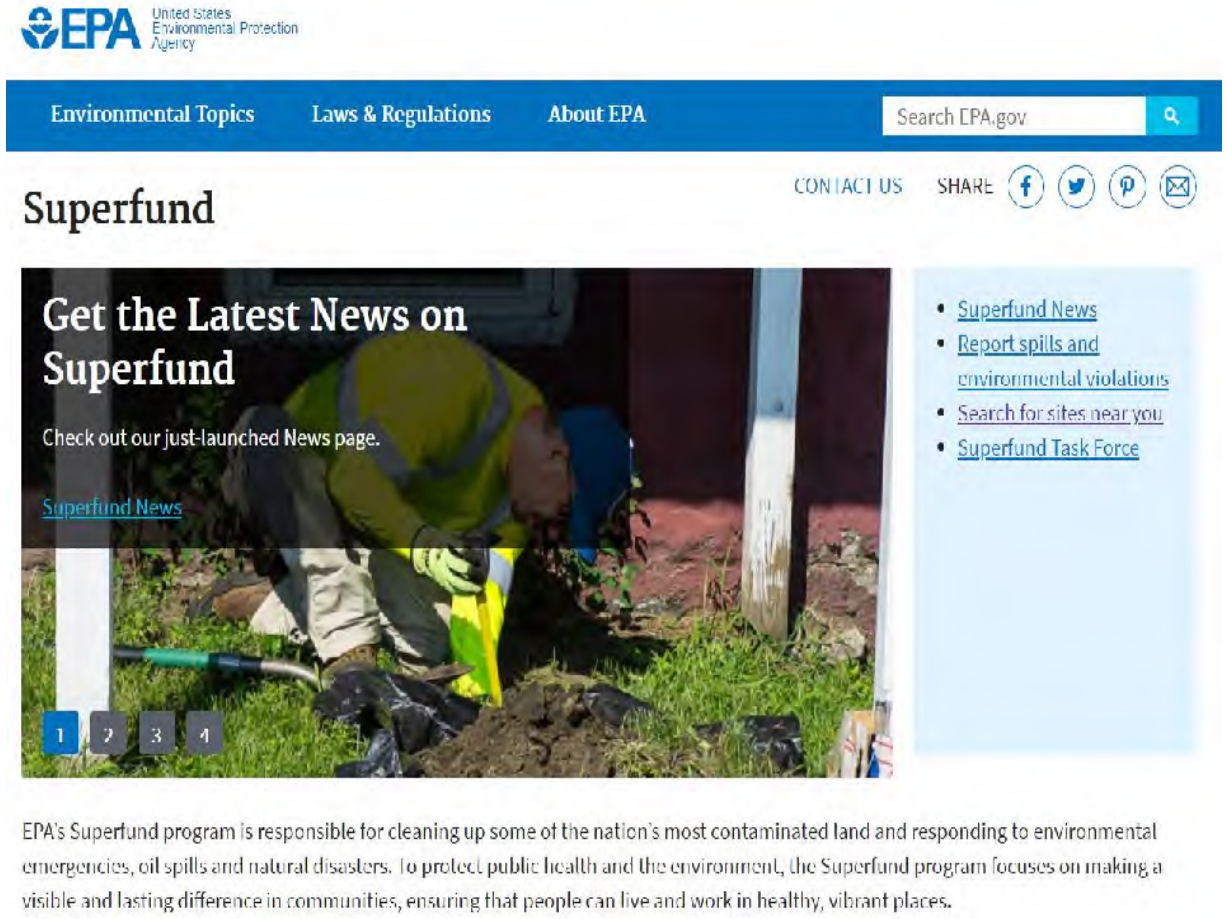
- Summary of Work Completed in 2018
- Preliminary results & findings from 2018
- 5-Year Review Status/Update
- Schedule of Reports
  - Annual Report
  - Site Investigation Reports
  - Project Completion Reports
- Any additional pertinent Site impacts

2018 Significant Milestones

- 5 YR Review Report (EPA)
- Well Installations
  - 10 monitor wells + 5 engineering wells
  - New well development and sampling
- Annual Sampling
- UBZ-1&2 pump testing
- Se Treatment Demonstration Unit
  - Vendor selection
  - Preliminary design complete
  - Detailed design underway

4th 5-Year Review completed by EPA in 2018

- Entire report can be found on EPA website:
  - https://www.epa.gov/superfund
  - Click “Search sites near you”
- Completed items from 2013 5-Year Review
- Issues/Recommendations from 2018 5-Year Review



2013 Recommendations

1. Define full extent of groundwater plume: Component of Focused Remedial Investigation (FRI)
2. Domestic Well Survey: Complete 4/15, 4 Wells below Monsanto RG's
3. Source Characterization: Complete (Individual Reports & FRI)
4. Sediment Monitoring Soda Creek: Complete

2018 Recommendations

1. Complete FRI & Focused Feasibility Study (FFS)
2. Develop Institutional Control plan for Groundwater
3. Source Extent and Response (FRI/FFS)
4. Soda Creek Sediment Monitoring (2022 5-YR Review)
5. Annual Surface Water Quality (Record of Decision (ROD) Amendment or Explanation of Significant Differences ESD))
6. Execute FRI…FFS

2018 Well Drilling

15 Wells

- TW89-90: Southwest Selenium Plume refinement
- TW91-98: UBZ3-4 gradient definition, fault delineation, MST
- TW99-103: Engineering Wells for future water management

Annual Water Quality Sampling

OVERVIEW

- Completed June 5 to June 21, 2018
- Sample Locations:
  - 92 Wells including:
    - 4 Plant Wells
    - 1 Irrigation Well ((b) (6)) and 1 Industrial Well (Independent Drilling)
    - 86 Monitoring Wells including 2018 Monitoring Wells
  - 11 Springs
    - Calf Spring and Humble Spring dry June 2018 – No Samples
  - 14 Surface Water Locations (Soda Creek, Power Canal, Little Spring Creek)
  - 2 Non-Contact Cooling Water Locations

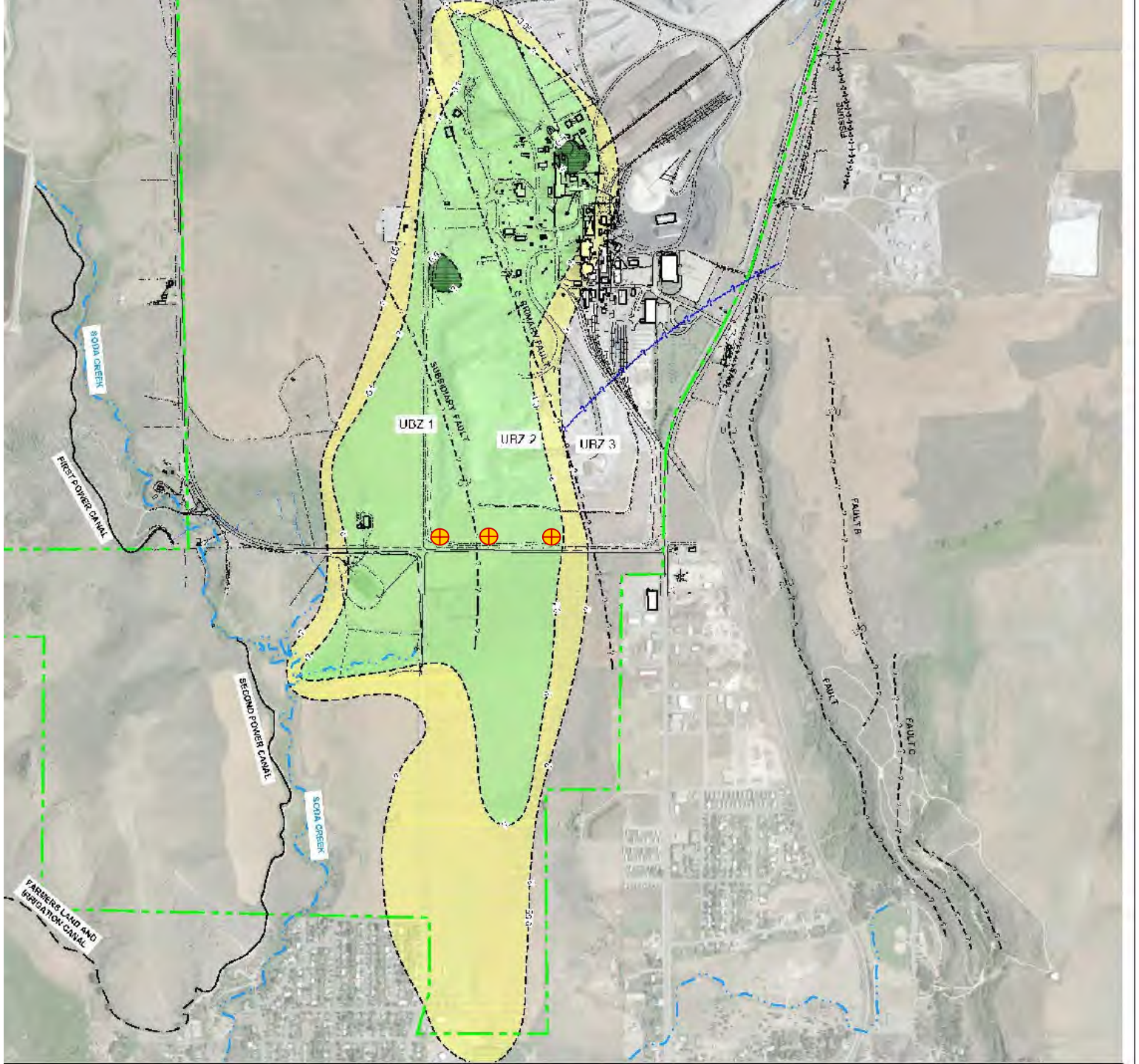
2018 Water Quality Sampling

KEY FINDINGS

- General water quality trends unchanged except:
  - In UBZ-1 and UBZ-2 influenced by pumping test
    - ✓ POC wells TW-20, 54, 55 now less than Se RG
    - ✓ POC wells TW-20, 39, 54 now less than NO3 RG
    - ✓ POC well TW-39 now less than F RG
  - Isolated locations at North End of Plant (e.g., TW-50) now appear to be trending to lower concentrations in some but not all wells
- Nature and Extent of Plumes similar to last year interpretation except selenium & nitrate

Point of Compliance Locations

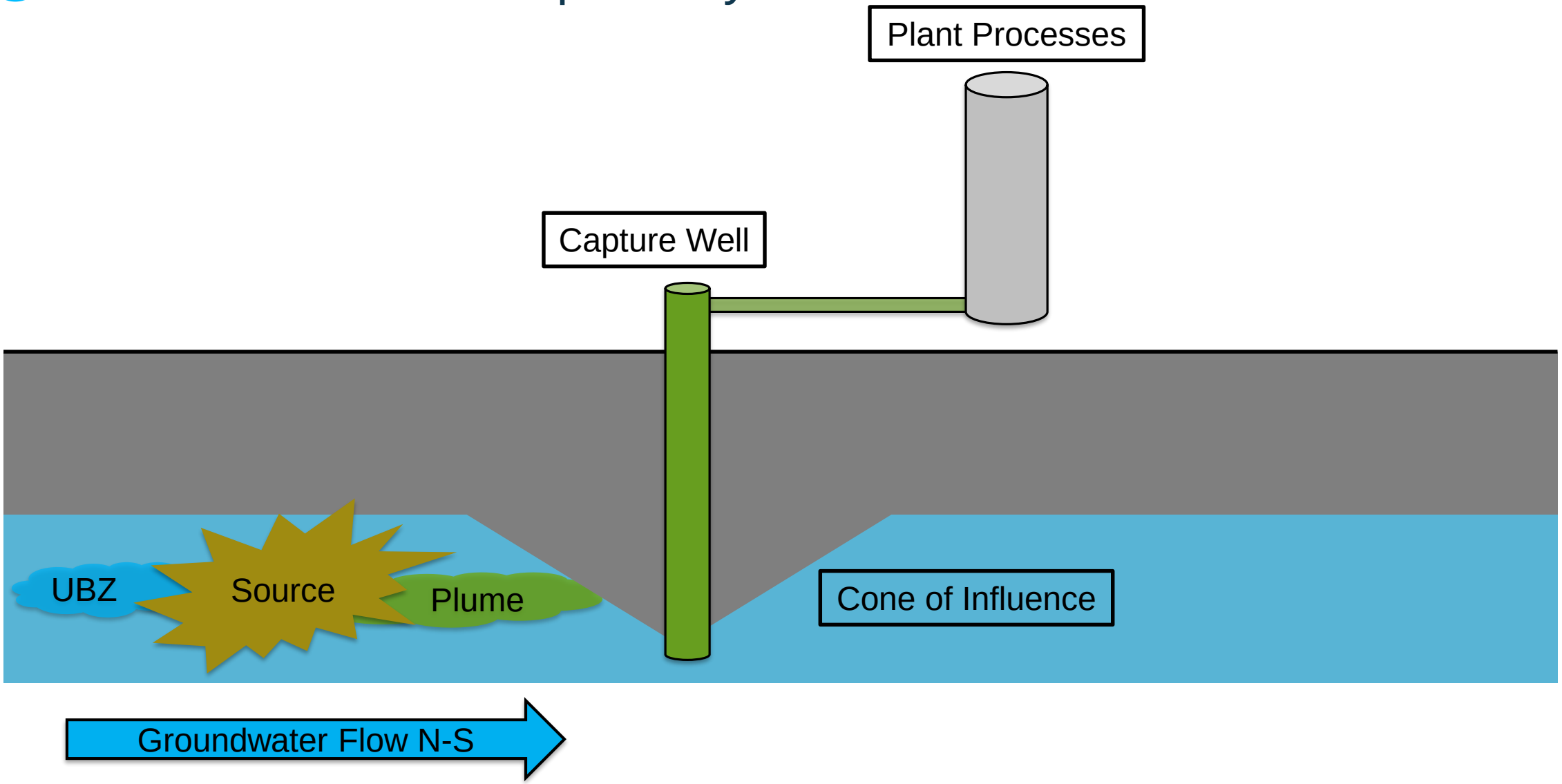
2017 Selenium Plume



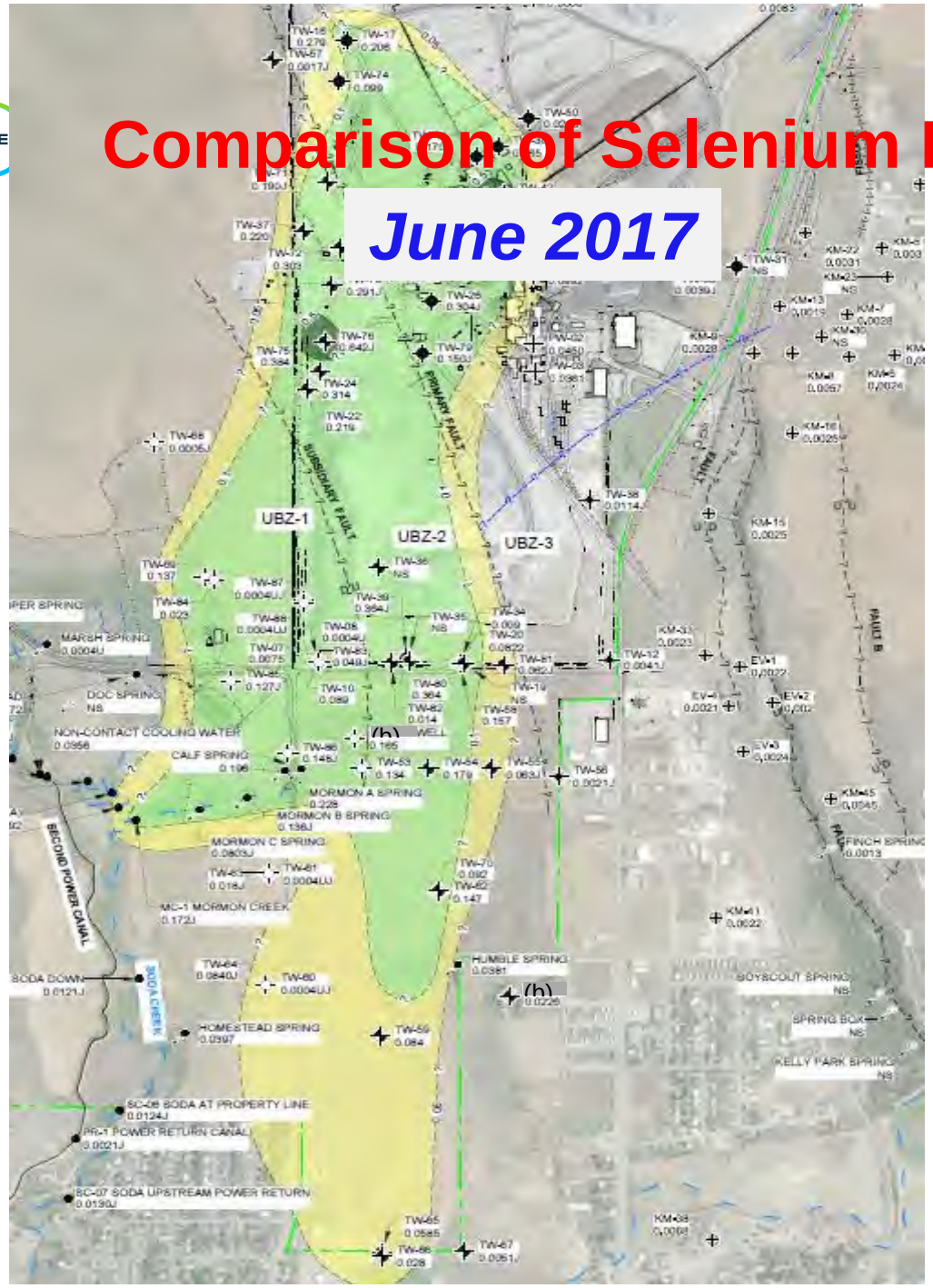
Groundwater Plume Response

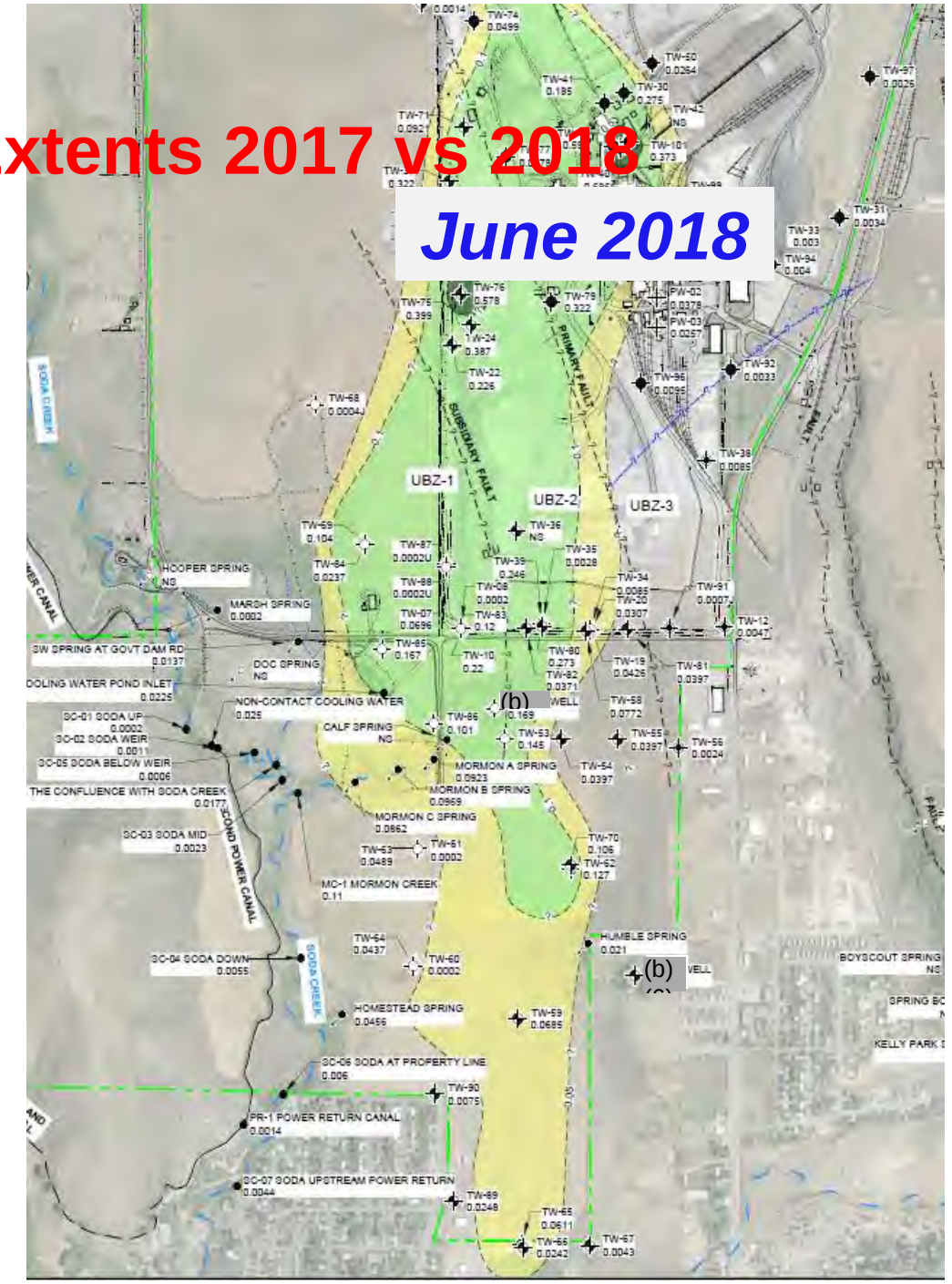
- How much water?
  - Model supplemented with extensive pump testing
- Quality of Groundwater?
  - Concentrations and changes over time…sampling during pump testing
- How to manage the water?
  - Consumptive (evaporation) combined with treatment

Selenium Plume Capture System



Comparison of Selenium Plume Extents 2017 vs 2018





Selenium Plume Capture System

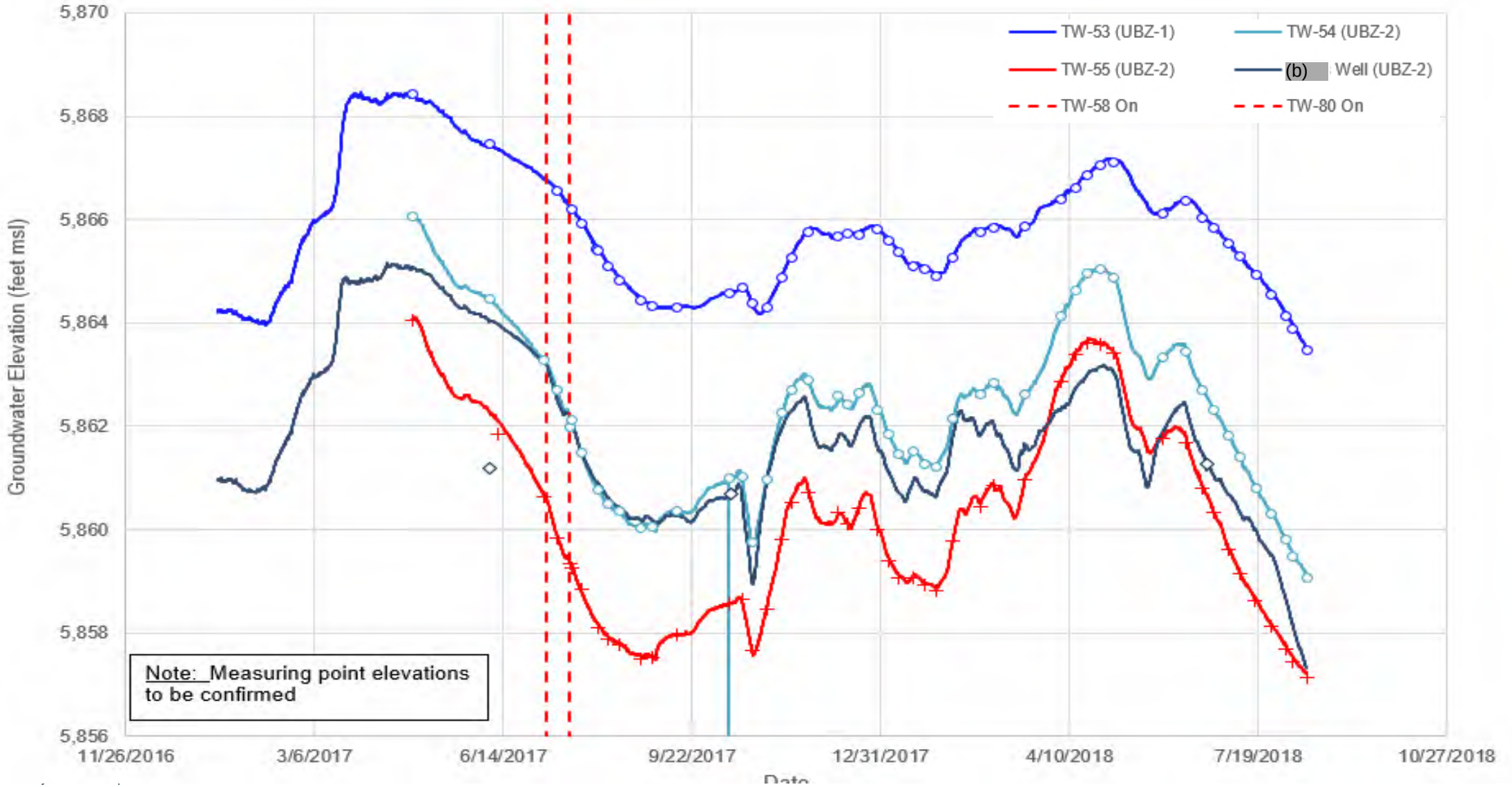
Capture Wells

Selenium Treatability

- Pump Testing
  - July 2017-July 2018
  - Rate: 0gpm to >400gpm (170gpm target)
    - Rates vary due to plant usage limits and seasonal variability
  - Selenium concentration ~250ppb (combination of 3 wells)
  - Data - input to groundwater flow model
  - Captured water kept within the plant (used to evaporation)

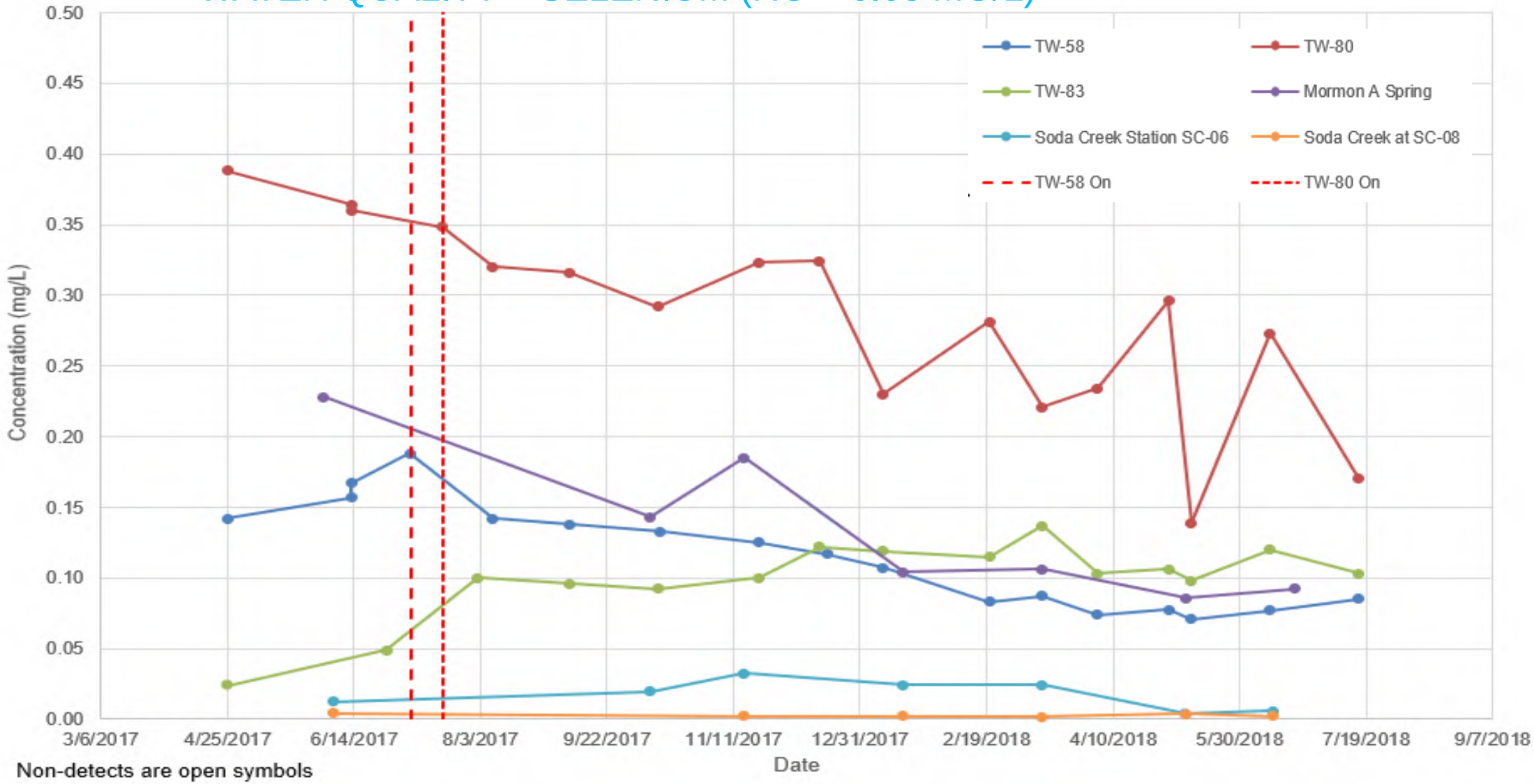
Pump Testing of Capture Wells

UBZ-2 WELLS – SOUTH OF PLANT

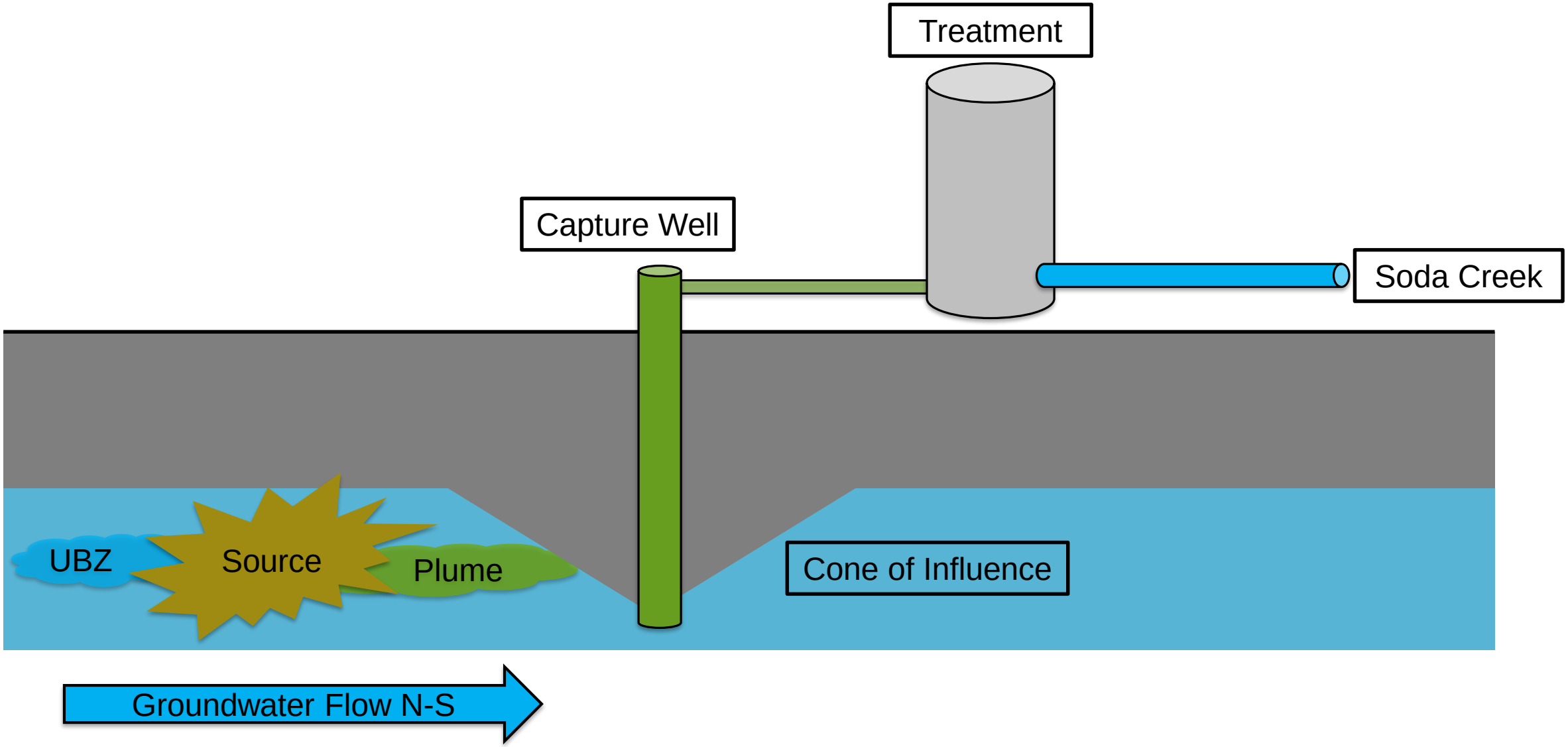


Pump Testing of Capture Wells

WATER QUALITY – SELENIUM (RG = 0.05 MG/L)



Pump and Treat Concept



Status: Water Treatment Study

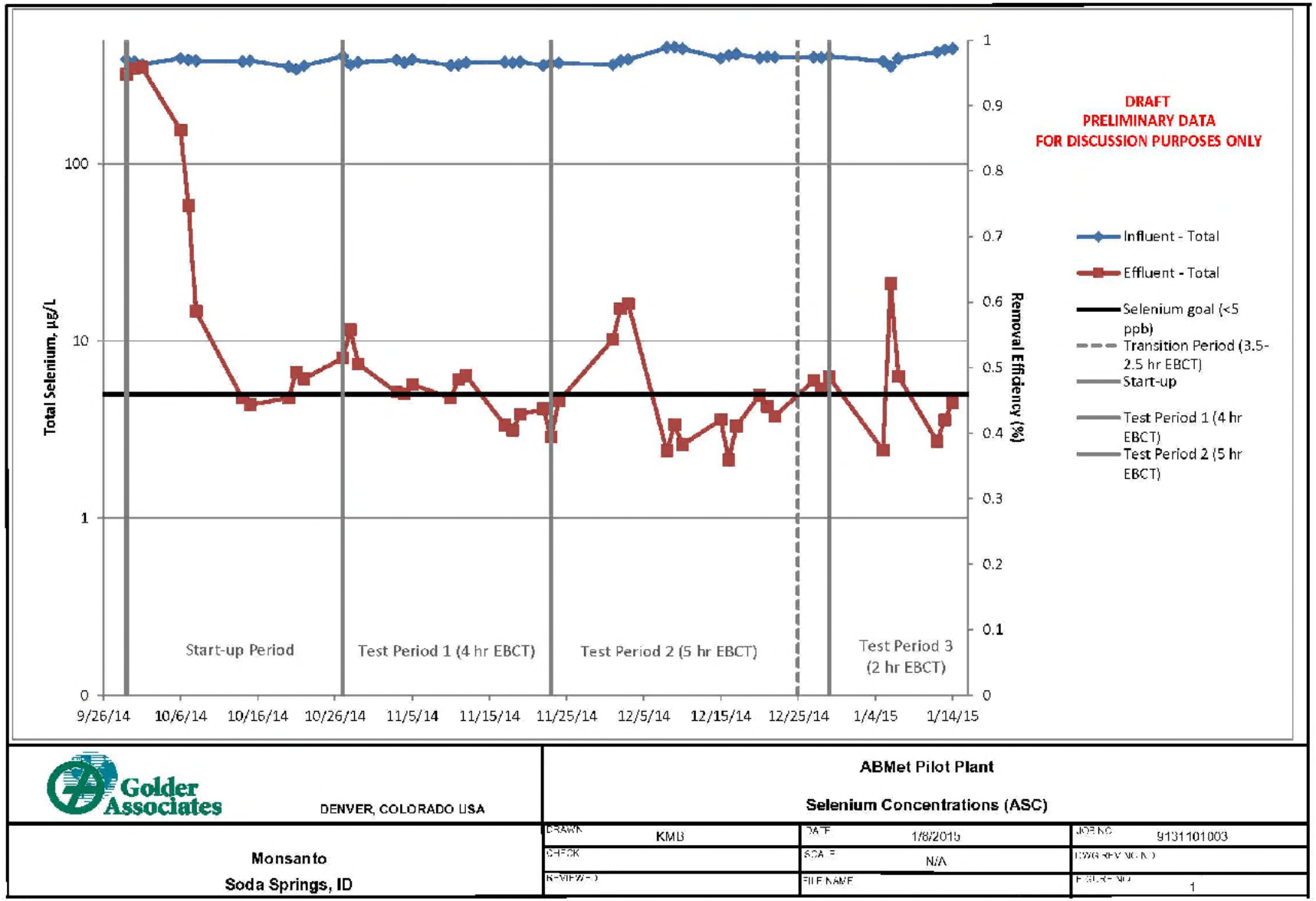
Selenium Treatability

- Technology Screening
  - Two vendors identified: Frontier Water Systems, SeHawk & GE, AbMet (sold to Suez)
  - Based on water chemistry and anticipated treatment goals
- Pilot Testing (2015-2017)
  - 4-8 months for each vendor
  - <5gpm
  - Selenium reduction from ~300ppb to <10ppb

Suez AbMet Pilot System

Suez Water, AbMet

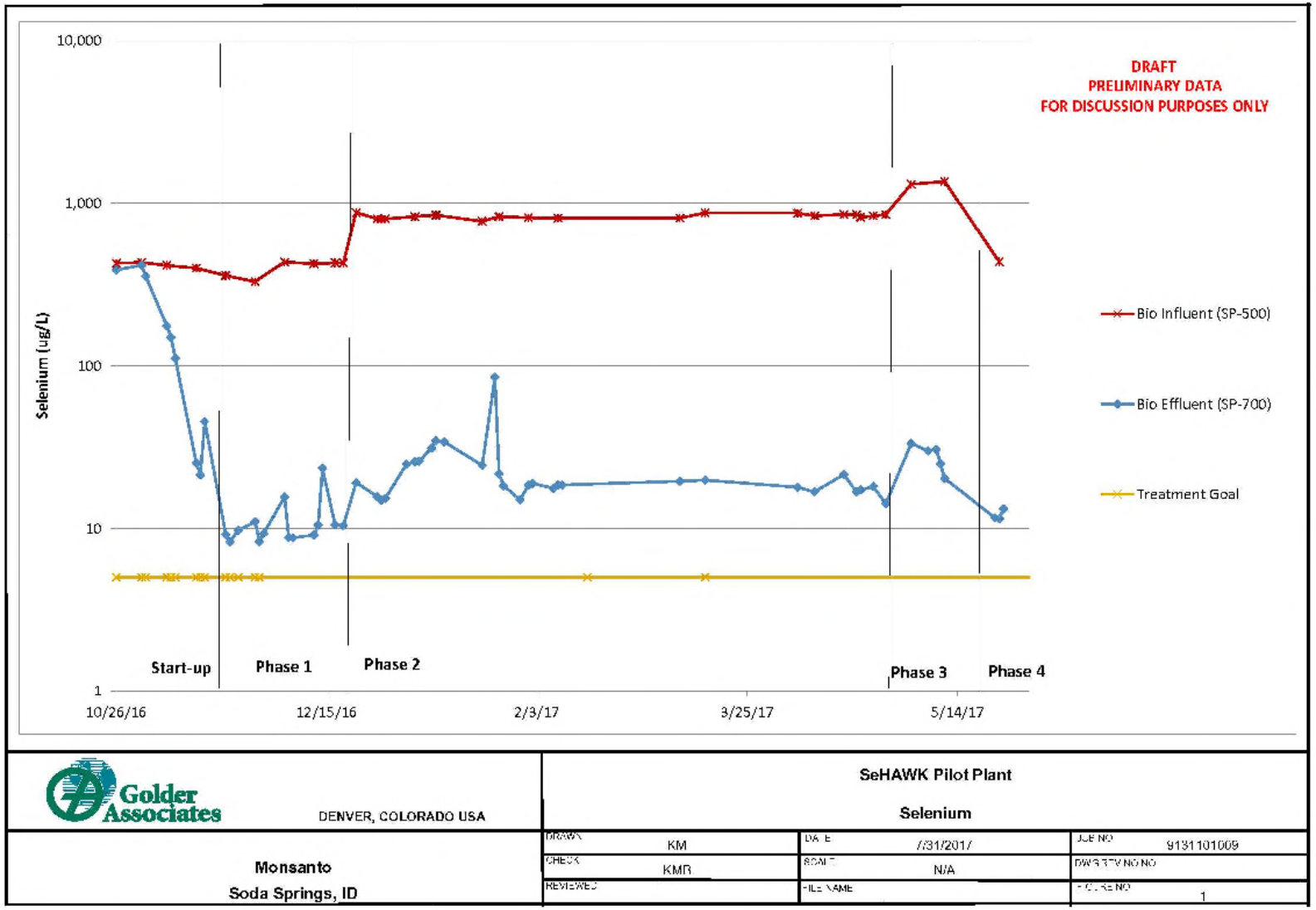
Selenium Treatability



Frontier SeHawk Pilot System

Frontier Water Systems, SeHawk

Selenium Treatability



Selenium Treatment Systems

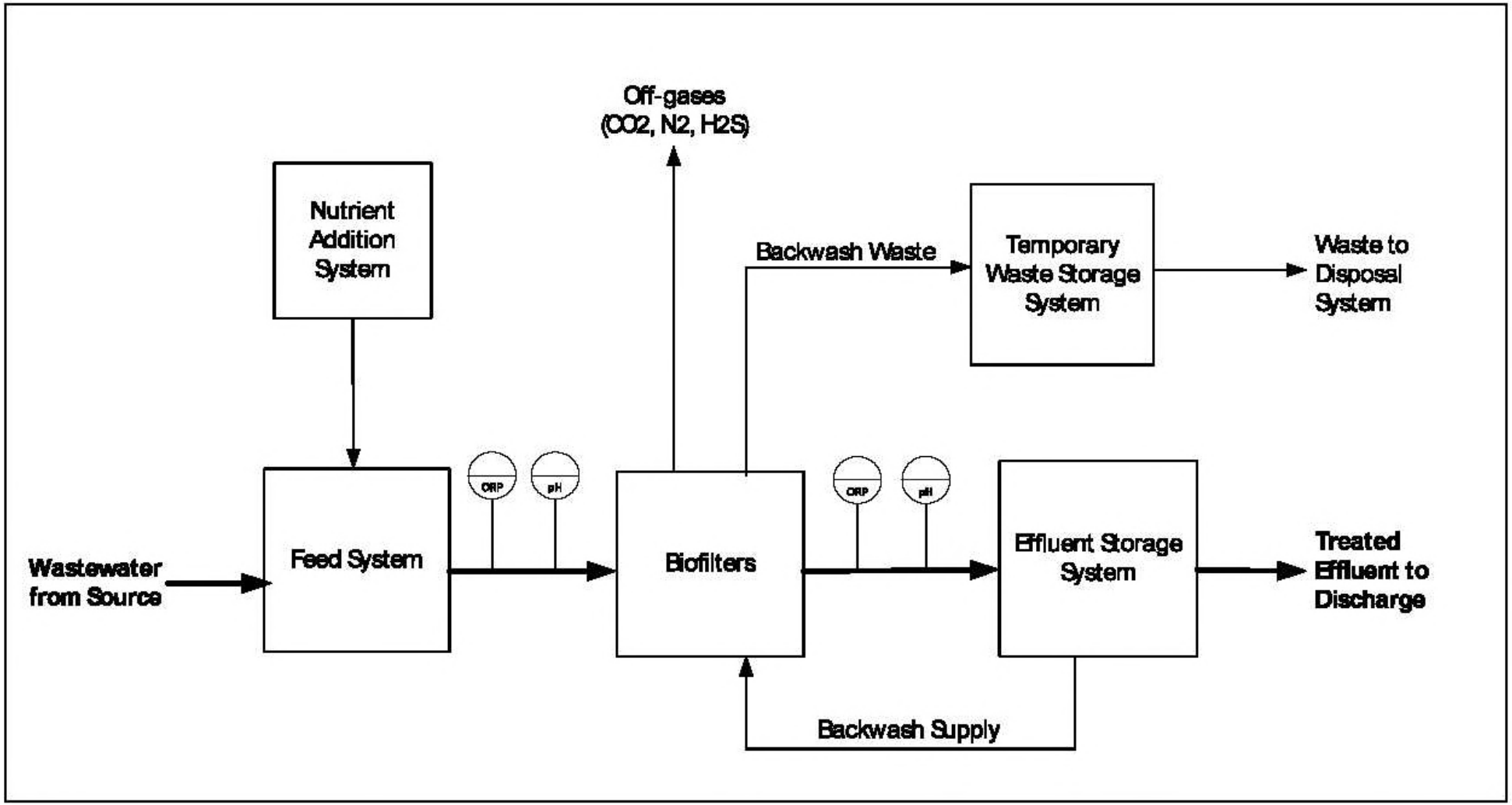
Frontier Water Systems (SeHawk)

Suez (AbMet)

https://www.waterworld.com/articles/iww/print/volume-15/issue-6/features/new-effluent-limit-guidelines-for-steam-electric-power.html

Suez Selenium Treatment

Demonstration Unit



Selenium Treatment Next Steps

Selenium Treatability

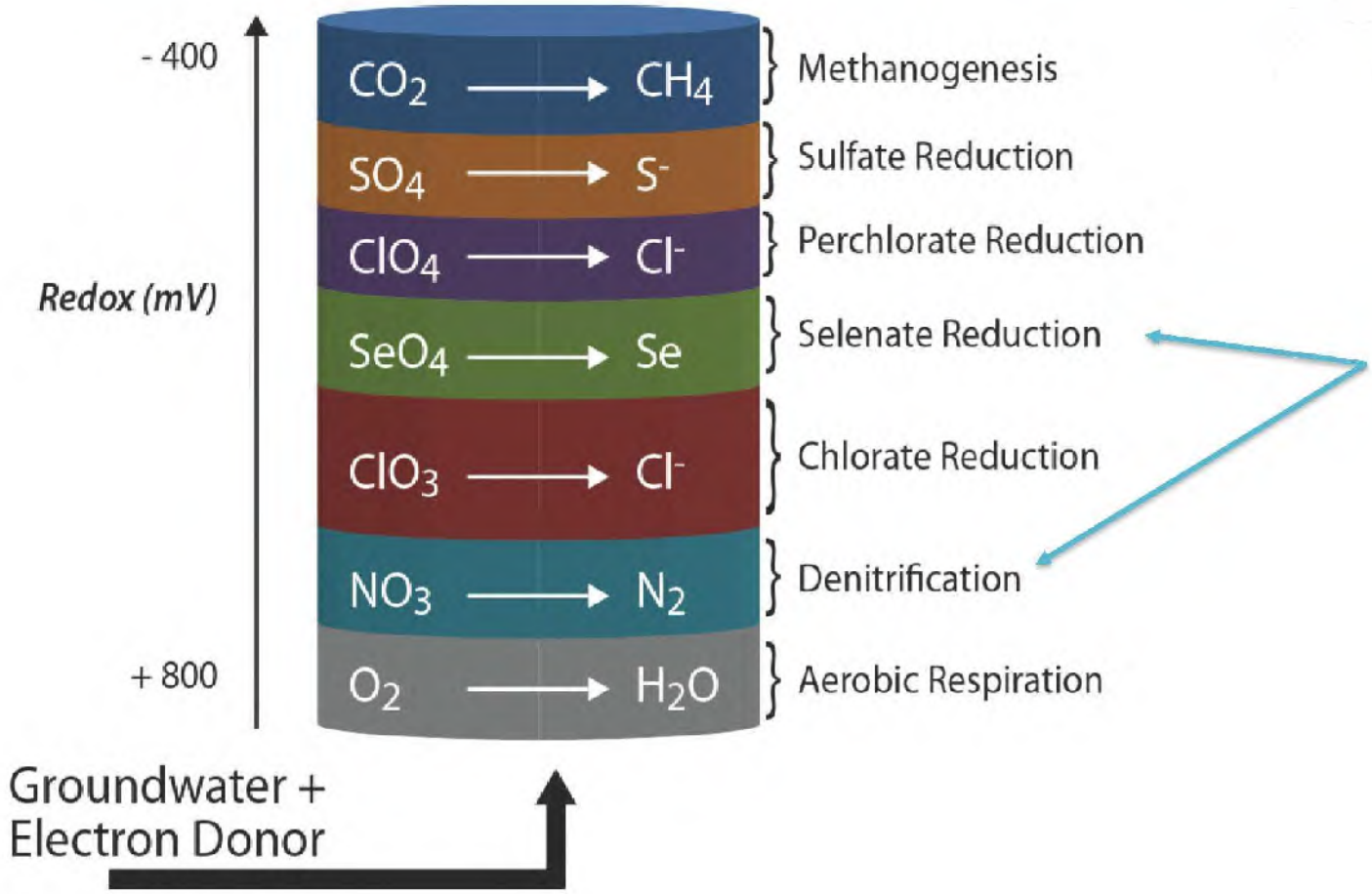
- Water Data + Treatment Technology = Demonstration Unit:
  - 400gpm
  - ~300ppb influent
  - <10ppb effluent
  - Suez's AbMet selected based on extensive decision matrix
    - Performance
    - Complexity
    - Cost

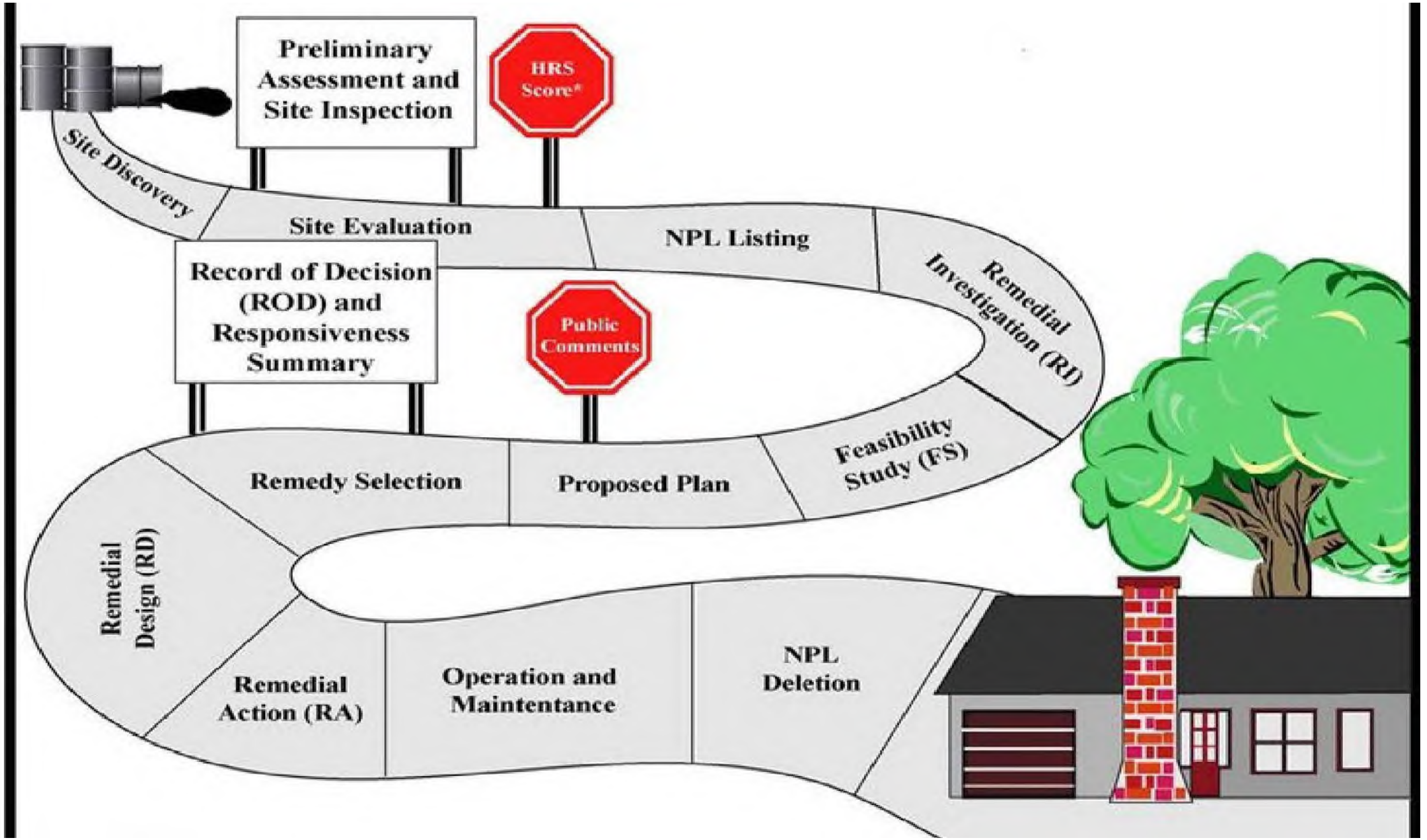
Suez Selenium Treatment

Demonstration Unit

- Suez & Golder and Assoc.
  - 5 reactor system + ancillary equipment
  - Preliminary Engineering (30%) complete 10/15/18
- Bayer
  - Utility Design and Delivery
  - Structure Design
  - Regulatory management

Redox Profile of Biological Reduction




Preliminary Assessment and Site Inspection
HRS Score*
Site Discovery
Site Evaluation
NPL Listing
Remedial Investigation (RI)
Record of Decision (ROD) and Responsiveness Summary
Public Comments
Feasibility Study (FS)
Proposed Plan
Remedy Selection
Remedial Design (RD)
Remedial Action (RA)
Operation and Maintentance
NPL Deletion

CERCLA Schedule (estimated dates)

- Focused Remedial Investigation: Late 2019
  - Water Quality: Annual Reports & 5-Yr Reviews
  - Source Characterization
  - Hydrogeology/Fate & Transport
- Focused Feasibility Study: Late 2022
  - Pump and Treat Evaluation
  - Technology Screening/Pilot Testing
- Record of Decision: 2023-2024
  - Remedial goals defined & Remedy selected
- Remedial Action
  - Implementation of selected remedy

Demonstration Unit Key Items (dates subject to change)

- Vendor Selection: October 2018
- 30% Engineering (preliminary): December 2018
  - Suez equipment on order
- 60% Engineering (detailed): February 2019
  - Building Spec & Ancillary design
- 90% Engineering: May-June 2019
- 100% Engineering: July 2019
  - Groundbreaking August-September 2019
  - Construction complete-Startup: February 2020
- Commissioning: February-June 2020 (~18 months runtime)

Questions?

Thank you!